WHAT IS CLAIMED IS:

1. An apparatus for drawing an optical fiber comprising:

a melting furnace for melting an optical fiber preform;

a preform feeder for feeding the preform to the melting furnace;

a capstan for drawing an optical fiber by pulling the preform from the melting furnace;

an outer diameter measurement unit for measuring an outer diameter of the drawn optical fiber; and

a control unit for controlling the outer diameter of the optical fiber, wherein the control unit includes a calculation unit for receiving a drawing speed signal output from the capstan and calculating a feed speed of the preform.

2. The apparatus as set forth in claim 1, wherein the control unit regulates the outer diameter of the optical fiber by regulating the speed of the capstan according to a signal received from the outer diameter measurement unit indicating a change in the outer diameter of the optical fiber.

3. The apparatus as set forth in claim 1, wherein the calculation unit calculates a slope of the drawing speed during a previously arbitrary period of time and obtains an expected drawing speed of a future arbitrary time period by using the calculated slope, and estimating a compensation value according to a difference between the present drawing

speed and a target drawing speed as well as a compensation value according to a difference between the present drawing speed and the expected drawing speed of the arbitrary time later, and calculates the preform feed speed based on the estimated compensation values.

4. The apparatus as set forth in claim 3, wherein the previously arbitrary time period includes a period prior to an automatic feed by the preform feeder.

5. A method of controlling a feed speed of an optical fiber preform, comprising the steps of:

(a) storing data representing a drawing speed of an optical fiber at intervals of a sampling period;

(b)checking a result as to whether the present drawing speed is in one of (i) a stable drawing speed range and (ii) an unstable drawing-speed range;

(c) beginning an automatic control of a preform feed speed when the check result indicates that the perform speed is in the unstable drawing-speed range;

(d) obtaining a recent drawing-speed change tendency within a predetermined period of time based on the stored drawing speed data;

(e) obtaining an expected deviation of the drawing speed of a subsequent arbitrary time based on the recent drawing-speed change tendency;

(f) obtaining a compensation value of the preform feed speed based on the expected value;

(g) obtaining a modification value of the preform feed speed by modifying the

compensation value so as to accelerate the drawing speed toward the stable drawing-speed range; and

(h) adding or subtracting the modification value of the preform feed speed to or from a target speed.

6. The method as set forth in claim 5, wherein in the step (d) includes classifying the speed tendency into five types comprising (i) long-period acceleration, (ii)short-period acceleration, (iii) uniform speed, (iv)short-period deceleration, and (v) long-period deceleration.

7. The method as set forth in claim 6, wherein in step (e), the expected deviation of the drawing speed of the subsequent arbitrary time is determined for each tendency type based on each of the following equations, respectively:

in a case of long-period acceleration, $V = \{(D - D2) \times 2 + D2\} - T$;

in a case of short-period acceleration, $V = \{(D - D1) \times 3 + D1\} - T$;

in a case of uniform speed, $V = (D - T) \times 3$;

in a case of short-period deceleration, $V = \{(D - D1) \times 3 + D1\} - T$; and

in a case of long-period deceleration, $V = \{(D - D2) \times 2 + D2\} - T$,

wherein "V" denotes the expected deviation, "D" the present drawing speed, "D1" a drawing speed of a time t1 ago, and "D2" a drawing speed of a time t2 ago.

8. The method as set forth in claim 5, wherein the compensation value of the preform feed speed in step (f) is determined by the following equation:

$$CV = (Df/Dp)^2 \times 2V$$

$$= [\{Dp\sqrt{(Sp/(Sf \times 1000))}\}/Dp]^2 \times 2V$$

$$= (Sp \times 2V) / (Sf \times 1000),$$

wherein "Df" denotes an outer diameter of a drawn optical fiber, "Dp" an outer diameter of the preform, "Sf" the drawing speed of the optical fiber, and "CV"the compensation value of the preform feed speed.

9. The method as set forth in claim 6, wherein the modification value of the preform feed speed in step (g) is determined by the following equation:

$$CS = (CV/3)^2,$$

wherein "CV" denotes the compensation value of the preform feed speed, and "CS" the modification value of the preform feed speed.

10. The method as set forth in claim 5 , wherein step (h) comprises that, the preform feed speed is classified to be transmitted so as to prevent an abrupt change of the preform feed speed.

11. The method as in claim 9, wherein in the step of adding or subtracting the modification value of the preform feed speed to or from the target speed, the preform feed speed is classified to be transmitted so as to prevent an abrupt change of the preform feed

speed.

12. The method as set forth in claim 10, wherein the classifying transmission procedure comprises:

a first step of obtaining a deviation by subtracting the present preform feed-speed from the target speed;

a second step of maintaining the present feed speed as it is when the obtained deviation is in a predetermined range from a negative predetermined value to a positive predetermined value; adding the negative predetermined value to the present feed speed when the obtained deviation is less than the negative predetermined value, and adding the positive predetermined value to the present feed speed when the obtained deviation is more than the positive predetermined value; and then determining the added present feed speed as the present feed speed; and

a third step of repeating the first and second steps until the preform feed speed reaches the target speed.